

## Supporting Information

### **Seedless synthesis of single crystalline Au nanoparticles with unusual shapes and tunable LSPR in the near-IR**

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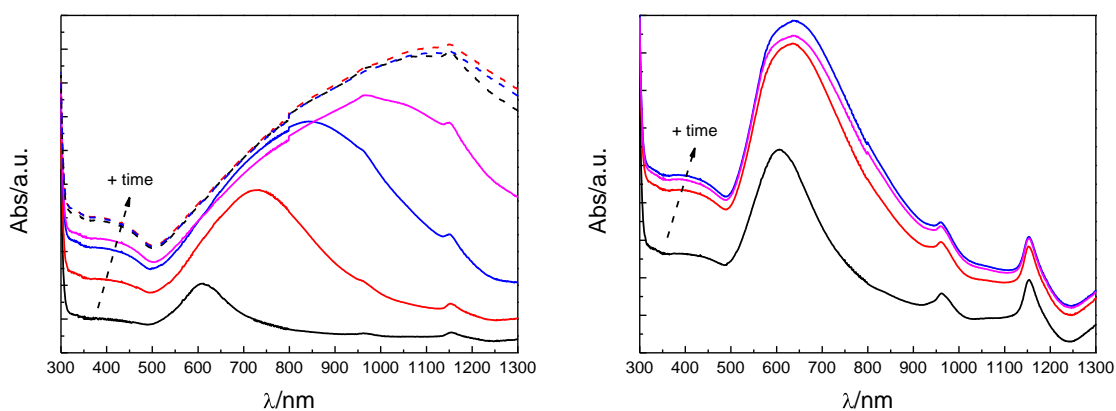
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#### **1) 3D-Tomography videos**

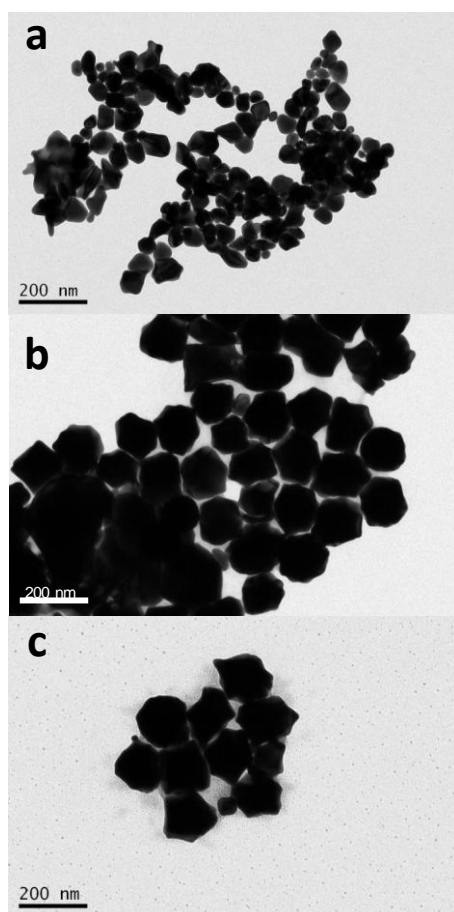
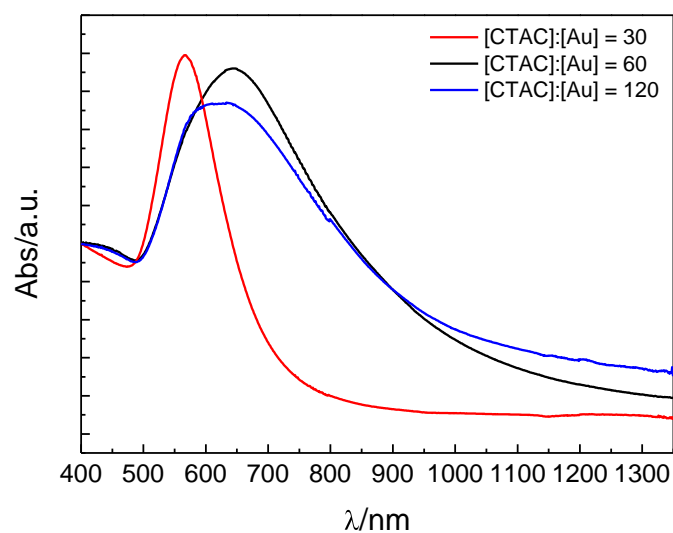
Videos showing the 3D reconstruction of 10°C and 20°C particles, obtained by 3D-Topmography (see Experimental section). The 3D reconstruction is represented as a rendering in which intensity differences actually represent the projected thickness along a certain direction. In addition, the final part of each movie shows slices through the 3D reconstruction.

#### **2) Growth process**

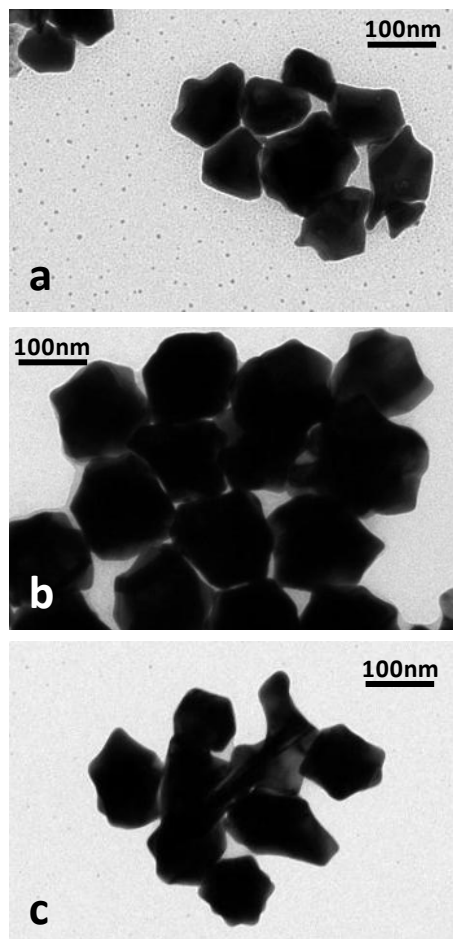
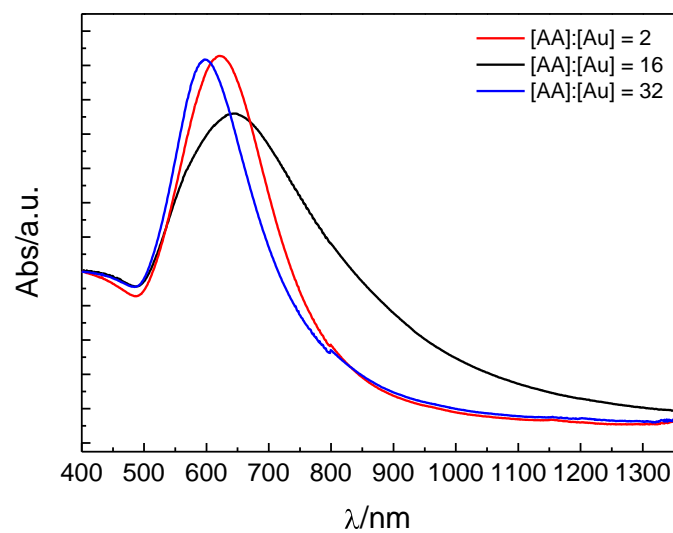


**Figure S1.** Visible-NIR spectra as a function of reaction time for particles prepared at 15°C (*left*) and 30°C (*right*).

### 3) Effect of the [CTAC] and [AA] variation, at 30°C



**Figure S2** *On top:* visible-NIR spectra (normalized at 400 nm) of particles synthesized at 30°C with different [CTAC]:[Au] molar ratios. *Bottom:* TEM images of the particles obtained with [CTAC]:[Au] = 30 (a), 60 (b) and 120 (c). [AA]:[Au] = 16 in all cases.



**Figure S3** *Top*: visible-NIR spectra (normalized at 400 nm) of particles synthesized at 30°C with different [AA]:[Au] molar ratios. *Bottom*: TEM pictures of the particles obtained with [AA]:[Au] = 2 (**a**), 16 (**b**) and 32 (**c**). [CTAC]:[Au] = 60 in all cases.